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Florida Department of
Environmental Protection

Memorandum

TO: Sally Heuer
Mary Nogas, Northeast District Office

THROUGH: Jim Crane, Technical Review Section, BWC

FROM: Ligia Mora-Applegate, Technical Review Section, BWC

DATE: September 20, 1996

SUBJECT: **Health Evaluation**
Mary Mcleod Bethune Elementary School/Brown's Dump Site
Jacksonville, Duval County, Florida

Dr. Stephen Roberts (UF toxicologist on contract to FDEP) has reviewed the above mentioned document and provided the following observations (attached). I concur with his comments and recommend that they be addressed in their entirety.

Attachment

cc: Zoe Kulakowski
Brian Cheary

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September 19, 1996

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
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2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Ms. Mora-Applegate:

I have reviewed at your request the document entitled *Health Evaluation, Mary McLeod Bethune Elementary School/Brown's Dump Site, 4330 Pearce Street, Jacksonville, Florida*. This document, prepared for the City of Jacksonville Solid Waste Division, presents the results of an analysis by EMCON evaluating current and potential human health impacts associated with the Mary McLeod Bethune Elementary School/Brown's Dump site in Jacksonville. Based on my review of this document, I have several comments.

1. The source of contamination at this site is deposit ash from the City of Jacksonville incinerator. The focus of the health evaluation is clearly on lead although, given the source of contamination, other contaminants might also be expected to be present in appreciable concentrations. Section 2.2 states that "Other inorganic elements were not markedly elevated in ash compared with soil, " but no information is provided about organics. It would be reasonable to suspect that dioxins might be present also in the municipal incinerator ash, for example. Unfortunately, the suitability of the CAR to support a meaningful health evaluation cannot be assessed based on the information provided in this report.

The extremely brief description of the results of the CAR provided in Section 2.2 also makes it difficult to gain an appreciation of the concentrations of lead to which individuals are likely to be exposed. Soil lead concentrations are described as generally in the 1,000 to 2,000 mg/kg range, but it is unclear how many samples this represents or the area(s) involved. Two samples in one location were described as having 78,800 and 43,400 mg/kg, implying that these were the highest concentrations observed. No information is provided, however, regarding the number of samples and distribution of concentrations between the "typical" (i.e., 1,000 - 2,000 ppm) and highest concentrations found.

2. In the exposure assessment, intake is calculated based on a "typical" lead concentration in soil of 2,000 ppm. No attempt was made to calculate intake for children exposed to areas in which higher soil concentrations were observed. Thus, while the intake estimates may be applicable for most areas, there are some areas for which intake by children would be higher, perhaps much higher. Information regarding the plausible range of intakes for children, based on differing levels of contamination in different areas, should have been included in the analysis.

3. Section 4.2 contains a summary of studies examining the relationship between various sources of lead contamination and blood lead concentrations. As indicated by this summary, soil lead concentration is but one of many factors that may contribute to blood lead levels, and there are certainly examples of situations in which it does not appear to be the dominant factor. It should not be construed from this that soil lead concentrations are, in general, unimportant contributors to risk of lead toxicity in children, however. Prudent public health protection practice dictates that elevated lead concentrations in soils in residential areas should always be addressed as a potential threat to health.

4. In Section 6.0, two questions are posed:

1) "Is there an elevated rate of high BPbs in children frequenting the site (above 10 µg/dl)?"; and

2) "Is there a potential for BPbs to become elevated in children through exposure in the future in the absence of remedial action?"

The report reaches the conclusion that the rate of children with elevated blood lead levels is not increased at this site, and that the potential for BPbs to become elevated in children in the future is low. The basis for both of these conclusions is tenuous at best:

- Not much detail is available regarding the blood lead study. Apparently the sampling was biased rather than random, and there is no indication of the estimated fraction of potentially-exposed children that were included in the blood lead survey. As such, there is little justification for the stated assumption in the report that the sampled population is representative of the overall population at risk.

- Because of confidentiality requirements, addresses for the children participating in the study cannot be obtained. Further, there is apparently little or no data regarding soil lead concentrations within individual yards in the neighborhood. As such, there is virtually no data with which to compare blood lead concentrations with soil lead concentrations, and no way to know if children with the highest lead concentrations at home were included in the survey.

- Blood lead measurements reflect only recent exposure — not long-term exposure. Information provided on page 6-1 of the health evaluation suggests that blood lead levels were measured only once for each child, and that the blood samples were collected in late May and early June. These data may or may not reflect exposure at other times, or in fact be indicative of their overall chronic lead exposure. For children in school, in particular, contact with soil at home may be expected to increase substantially during the summer months when school is out of session. Accordingly, blood lead concentrations in these children may have been higher had they been collected at the end of the summer rather than the end of the school year.

- In evaluating current and potential future exposure of children to lead in soils and other media, the USEPA has developed the Integrated Exposure Uptake Biokinetic Model (IEUBK). The Health Assessment states (pg. 3-2, line 18) that the IEUBK model "... is intended as a predictive tool in cases where actual BPbs are not available (1994c). In the case of Brown's Dump, modeling is not necessary, as a Pb database exists." In fact, the use of the IEUBK model is not restricted to situations were blood lead data are unavailable. USEPA guidance ("Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities", OSWER Directive 9355.4-12, July, 1994) states, "The Guidance Manual recommends that blood lead data not be used alone either to assess risk from lead exposure or to develop soil lead cleanup levels. During its review of the IEUBK model, the SAB [Science Advisory Board] supported this position by asserting that site residents may temporarily modify their behavior (e.g., wash their children's hands more frequently) whenever public attention is drawn to the site. In such cases, this behavior could mask the true magnitude of potential risk at the site and lead to only temporary reductions in the blood lead levels of children. Thus, blood lead levels below 10 µg/dl are not necessarily evidence that a potential for significant lead exposure does not exist, or that such a potential could not occur in the future." [emphasis added]

The IEUBK should have been applied in this analysis to address, in part, the second question posed in Section 6.0.

- In the Health Assessment (pg. 6-3), part of the rationale for concluding that the potential for future exposure and risk is low is that the high-risk population (children) is in place in the neighborhood, contact with the ash is probably already high, and that the neighborhood has remained stable for decades. The problem with these arguments is that we know very little about how children are actually being exposed. The blood lead survey has limitations and there is no information with which to compare the distribution of contamination in the neighborhoods with the current distribution of households with young children (as discussed above). Also there is no means of assessment as to what barriers to exposure currently exist (e.g., landscaping and other physical features) that may or may not exist in the future. With so little knowledge, it cannot be concluded with confidence that future exposure and risk potential is low.

5. In Section 7, several Interim Remedial Measures are proposed. Each is reasonable and appropriate, and I recommend their implementation. At the same time, I would like to point out that these are only interim measures. A long-term solution for this site will likely involve much more. We have reviewed the most recent 100 Records of Decision (RODs) for USEPA sites involving lead-contaminated ash. In almost every case, it was ordered that the contaminated ash be removed from the site and placed in a designated hazardous waste landfill. Most of these were absolute removal of the medium. A minority of cases called for the remediation of the ash dumps to a maximum lead concentration of 500 ppm. None of the cases reviewed involved houses built directly on an ash dump site. The two cases that were most comparable involved residences adjacent to the site (American Chemical Services, ROD R05-92/217; and American Cressarm & Conduit, EPA -IDWAD057311094). In both cases, the initial contamination was between 500 and 1,500 ppm lead, and the EPA called for cleanup to a maximum of 500 ppm lead. In another case (Agate Lake Scrap Yard, EPA-ID980898068), where there were residences in close vicinity, the lead-contaminated ash was remediated to a maximum concentration of 350 ppm by an interim response action (IRA) prior to the final ROD. Only one case reviewed allowed for cleanup to higher concentrations (Bunker Hill Mining, ROD R100-92/041). This involved smelting tailings. Here they were allowed to remediate to a maximum of 1,000 ppm lead. However, the site had to be clay-capped and an ongoing project put in place to insure that the site will never be used for residential purposes.

6. The interim measures proposed in Section 7 should be implemented immediately, if they are not already in place. Also, relevany EPA guidance (e.g., "Agency Guidance on Residential Lead-Based Paint, Lead-Contaminated Dust, and Lead-Contaminated Soil",

Office of Prevention, Pesticides and Toxic Substances, EPA, July, 1994) should be consulted in establishing a short-term management strategy for this site. A long-term solution for this site must begin with a thorough contamination assessment, identifying all of the chemicals of potential concern and characterizing the extent and magnitude of their presence. Based on the documentation I have seen, I do not believe that such a contamination assessment has yet been performed for this site. This, too, should be initiated as soon as possible as part of a comprehensive site management effort.

I hope that these comments are useful. Should you have any questions about them, please do not hesitate to contact me.

Sincerely,

Stephen M. Roberts

Stephen M. Roberts, Ph.D.